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Progress in the implementation of the programme of action for the sustainable development of small island developing States

Report of the Secretary-General

Addendum

Biodiversity resources in small island developing States*

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I. Introduction

1. The biological diversity and the high degree of endemism of many species on small island developing States is well known. Over 4,00 species of plants and animals are endemic to small island developing States (see table). Because of their small size and the endemic nature of many species, the biological diversity of small island developing States is extremely fragile. One consequence of the relative isolation of small island developing States is the large incidence of unique biological adaptations – flightlessness in birds, gigantism and dwarfism in other groups, and many modifications of form, diet and behaviour. Restrictive habitats and small populations often generate unique features and adaptations to prevailing environmental and climatic conditions, but under such circumstances species often lack the ability to adapt to rapid changes (see table). Small island developing States are not a homogeneous group, although many of them face similar problems with respect to the conservation and management of their natural resources.

II. Current situation

2. The current situation on aspects of biodiversity in small island developing States is described below. The focus is on (a) deforestation and forest degradation, (b) traditional subsistence farming systems, (c) *in situ* and *ex situ* conservation facilities, (d) coastal and marine biodiversity, (e) freshwater biodiversity, and (f) aquaculture.

Deforestation and forest degradation

3. Deforestation and forest degradation in small island developing States have led to extinction of many animal and plants species, resulting in irreversible losses of genetic resources and ecosystems. Considering their limited land area and their relative fragility, strong winds (e.g., hurricanes, cyclones, typhoons) can cause serious and frequently recurring damage to natural and planted forests. The impacts of human activities are usually even more severe. Deforestation and forest degradation have affected the dynamic interactions of ocean, coral reefs, land formations and vegetation.

Traditional subsistence agriculture

4. This practice, using family labour and a few purchased inputs, remains predominant in over half of all small farms in small island developing States. It has the advantage of being generally environmentally friendly but has the disadvantage of low productivity. Growing population and economic pressures are disrupting ecologically sound farming practices, such as fallow rotation systems. Thus, moderate input systems are becoming more common in small island developing States. Because of inadequate farm and production management, these inputs are often not used effectively, leading to economic losses and environmental damage, including loss of biodiversity. With the encroachment of agriculture on natural or quasi-natural ecosystems, plant and animal genetic resources are being lost, modern cultivars are replacing local ones and intensive livestock production systems are developing. As a consequence, diseases and pests are increasing in small island developing States, particularly crop pests that are resistant to common pesticides.

Plant and animal genetic resources

5. These resources are the basis for sustainable agricultural production. It is particularly important for small island developing States to have access to plant genetic resources from countries in the same agro-chemical zone for the diversification of their main crops. The establishment of protected areas – forest reserves, national parks and wildlife sanctuaries, supported by botanical gardens, herbaria etc. – is essential for conserving small island developing States' biological diversity. Such areas also have the potential to become the basis for ecotourism. However, establishment of *in situ* and *ex situ* conservation systems require both financial and human resources, often not adequately available in small island developing States. Therefore, cooperation among small island developing States is proving desirable as a means of evaluating and conserving small island developing States' genetic resources and safeguarding them for future use. Fortunately, there appears to be a growing recognition of the dangers posed by the introduction of exotic genetic resources and the need for environmental impact assessments before such introductions take place. Practitioners of sustainable food production need access to reservoirs of crop cultivars, livestock breeds and aquaculture seeds with high productivity potential, good resistance and quality characteristics, and adaptability to local environments.

Marine ecosystems

6. Small island developing States' marine ecosystems and biodiversity are especially susceptible to damage, including destruction of coral reefs by fishermen or tourists; pollution, sedimentation and land reclamation; natural disasters; conversion of mangroves and wetlands that result in loss of important nursery areas; use of large-scale pelagic

Summary of the status of animal and plant species (threatened, extinct and endemic) in small island developing States and territories, and their conservation status, as measured by the number and size of legally protected areas

	Animals			*Plants*			*Protected areas*	
Country or area	*Threat*	*Extinct*	*Endemic*	*Threat*	*Extinct*	*Endemic*	*Number*	*Area (hectares)*
Antigua and Barbuda	6		4	3		1	13	6 628
Aruba	5		2				1	30
Bahamas	14	2	22	26		71	37	125 338
Barbados	3	1	3	3		2	6	290
Cuba	38	6	150	837	25	952	84	1 853 765
Dominica	6		4	59		97	7	17 028
Dominican Republic	33	7	37	71		54	24	1 049 599
Grenada	5		2	5		4	1	618
Haiti	28	8	46	27	1	26	9	9 975
Jamaica	29	2	72	376	2	382	165	176 914
Netherlands Antilles	8		4			3	6	12 271
St. Kitts and Nevis	5			3			2	2 625
St. Lucia	9	1	9	9		3	46	9 649
St. Vincent and the Grenadines	5	1	6	8		4	31	8 284
Trinidad and Tobago	10		6	16		27	16	20 887
US Virgin Islands	6	1	4	6	1	4	6	5 828
Caribbean subtotal	**210**	**29**	**371**	**1 449**	**29**	**1 630**	**454**	**3 299 729**
Cape Verde	7	1	13	1		114	5	1 415
Sao Tome and Principe	15		42	1		123		
Atlantic subtotal	**22**	**1**	**55**	**2**		**237**	**5**	**1 415**
Bahrain	6						4	1 325
Comoros	16		21	3		4		
Maldives	5							
Mauritius and Rodriguez	37	46	19	255	43	289	26	13 054
Seychelles	22	2	38	80	2	78	20	41 975
Singapore	21		1	14	1	16	9	3 173
Indian Ocean subtotal	**107**	**48**	**79**	**352**	**46**	**387**	**59**	**59 527**

Country or area	Animals			Plants			Protected areas	
	Threat	Extinct	Endemic	Threat	Extinct	Endemic	Number	Area (hectares)
Cyprus	10		4	49		131	27	101 227
Malta	10			15	1	24	8	311
Mediterranean subtotal	**20**		**4**	**64**	**1**	**155**	**35**	**101 538**
American Samoa	13	1		8		8	11	5 127
Cook Islands	8	14	7	10		12	1	160
Federated States of Micronesia	70	3	22	3		90		
Fiji	22		40	30	1	277	32	29 589
Kiribati	7		1				11	58 841
Marshall Islands	9							
Nauru	1		1					
Niue	1						3	
Northern Marianas	24		2	7		12	9	2 796
Palau (Belau)	70	1	12			3	3	1 459
Papua New Guinea	94	2	323	93		419	36	1 039 856
Samoa	10	1	9	20		67		
Solomon Islands	39	3	81	43		37		
Tokelau	4					1		
Tonga	10	1	3			3	10	3 727
Tuvalu	8							
Vanuatu	15		15	25		24	5	207
Pacific subtotal	**405**	**26**	**516**	**239**	**1**	**953**	**121**	**1 141 762**
Total	**764**	**104**	**1 025**	**2 106**	**77**	**3 362**	**674**	**4 603 971**

Source: World Conservation Monitoring Centre.

driftnets which impact marine mammals, turtles, birds and non-targeted fish; and overfishing in general. Coastal fisheries in small island developing States, once abundant, have become scarce owing to overfishing by both artisanal and small-scale commercial fishing. Inadequate monitoring makes it difficult to quantify the overall damage to marine life from such activities.

Freshwater biodiversity

7. Although it has not been studied as much as marine and coastal biodiversity, some small island developing States have important freshwater biological diversity. They include plants and animals that are rare, endemic, introduced species, including many that are threatened by habitat degradation. Unlike their marine counterparts, which may be dispersed over great distances by ocean currents, inland freshwater aquatic species have more restricted access to dispersion routes. Many native freshwater species are not currently utilized commercially and their status is not well documented.

Aquaculture

8. Although this industry is becoming more important for some small island developing States, the sector is faced with

constraints and sustainability problems. Because of little previous experience in fish farming in many small island developing States, often there are few domesticated native species. Thus, new and/or genetically improved species have been proposed, which may play an important role in future aquaculture development. However, the introduction of non-native species may have environmental impacts and alter traditional ownership rights to land and water resources.

9. In view of the many factors affecting the biological diversity of small island developing States, the responsibility for conserving this biodiversity is disproportionate to their capabilities. With regard to nature conservation through designation of protected areas, there is considerable variation among small island developing States; many small island developing States have no protected areas, while others, such as Fiji, the Bahamas and Cape Verde, have considerable networks, often incorporating over 10 per cent of their land area (see table).

10. Upon submission of the first national reports to the fourth meeting of the Conference of the Parties, more information on the current state of biological diversity of small island developing States and the status of implementation of the Convention on Biological Diversity will become available.

III. Efforts of small island developing States at the national and regional levels

11. Among the 41 States and self-governing territories classified as small island developing States by the United Nations, 32 have ratified the Convention on Biological Diversity; three others have become signatories as of 12 November 1997. Several small island developing States and archipelagoes in developing countries contribute to the international network of biosphere reserves and the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage List. Conservation in such areas is promoted through the exchange of information and experience among insular protected areas, the provision of technical assistance and training opportunities, and the development of comparative studies among groups of islands.

12. A pilot regional Global Environment Facility (GEF)-funded project in the South Pacific is being coordinated by the South Pacific Regional Environmental Programme (SPREP). It covers 15 island countries in the region, with the goal of protecting their biological diversity by facilitating establishment of conservation areas, with agreed development criteria based on long-term ecological sustainability. At the time of the mid-term review of the project in August 1996, 17 conservation areas were at various stages of planning and establishment.

IV. International efforts aimed at assisting small island developing States in the area of biodiversity

13. According to the GEF quarterly operational report of June 1997, GEF approved regular projects for the Comoros and Mauritius. It also endorsed enabling activities for 14 small island developing States, including Antigua and Barbuda, the Bahamas, Barbados, Cape Verde, the Comoros, Cuba, Fiji, Maldives, the Marshall Islands, Mauritius, Seychelles, Solomon Islands, Saint Vincent and the Grenadines, and Vanuatu.

14. In its preamble, the contracting parties to the Convention acknowledged the special conditions of the least developed countries and small island developing States. In its medium-term work programme, the Conference of Parties to the Convention, at its first meeting, agreed that the biological diversity of marine and coastal ecosystems would be the first thematic focus to be addressed at its second meeting. Subsequently, at its second meeting, the Conference of Parties, in its decision II/10, gave specific guidance to the Executive Secretary regarding the conduct of work in this programme area, and also suggested that the United Nations Secretariat support the work of its Subsidiary Body on Scientific, Technical and Technological Advice in regard to the special conditions of least developed countries and small island developing States. Subsequently, at its third meeting, in its recommendation III/2, the Subsidiary Body recognized the special significance of small island developing States in the global conservation of marine and coastal biological diversity.

15. In its operational strategy for coastal, marine, and freshwater ecosystems, GEF has agreed that the needs of tropical island ecosystems will receive particular attention. With regard to mountainous ecosystems, it has also indicated that activities in this operational programme will initially address the conservation and sustainable use of biodiversity areas under increasing human pressure and imminent threat of degradation, including tropical islands.

16. In March 1997, the governing body of the Food and Agriculture Organization of the United Nations (FAO) approved a programme of fisheries assistance for small

island developing States, which includes (a) institutional strengthening and national capacity-building; (b) enhanced conservation and management of exclusive economic zone fisheries; (c) improved post-harvest fish management and marketing; (d) a safety-at-sea component; (e) strengthening the economic role of national fisheries industries and privatization of fisheries investments; and (f) aquaculture and inland fisheries conservation, management and development.

17. During the period under review, FAO prepared a review of the uses and status of trees and forests in land-use systems in Samoa, Tonga, Kiribati and Tuvalu, including an annotated checklist of tree species of agro-forestry. The review contains recommendations for the development of agro-forestry strategies and the conservation of the diversity of species used in traditional agro-forestry systems. FAO previously assisted South Pacific countries in collecting, conserving, characterizing and documenting root and tuber crop genetic resources. It plans to evaluate the status of existing *ex situ* collections of plant and animal genetic resources for the South Pacific region, and to propose actions to address related problems. It is also attempting to strengthen national capabilities for the conservation and sustainable utilization of existing genetic resource collections. In the period 1992-1994, it supported an improved seed production project covering 14 countries in the Caribbean region. The objective was to strengthen national capacities to conserve and document existing varieties of crops. Field and laboratory standards were established for seed quality control for sexual seed and vegetative planting materials to facilitate exchange, seed production and further development of seed technology.

18. The Caribbean Amblyomma Programme, which is supported by the Caribbean Community, is jointly executed by FAO and the Inter-American Institute for Cooperation on Agriculture. It became active in Anguilla and Saint Kitts and Nevis in 1995, and in Montserrat and Saint Lucia in 1996. Dominica, which is surrounded by heavily infested islands, launched its national programme in February 1997, and Antigua and Barbuda and Barbados were expected to join in 1997. The Programme has made notable progress in strengthening veterinary services and helping Governments improve their legislation and quarantine procedures. With funds from Japan, FAO operates the Fiji-based South Pacific Aquaculture Development. Fifteen countries from the region participate in addressing problems of sustainable aquaculture development, including the responsible use of alien species, human resource development in aquaculture, economic viability, and stock enhancement aimed at rehabilitating fisheries and habitats, especially in coral reef areas. FAO and the United Nations Environment Programme (UNEP) have implemented a field project on stock enhancement of inland waters of Papua New Guinea. The project has facilitated the introduction of international codes of practice on the responsible use of introduced (alien) species intended to increase productivity of inland river systems. FAO's Special Programme on Food Security has also developed a multidisciplinary project in Papua New Guinea, involving water control, the intensification of production systems, diversification, the establishment of demonstration aquaculture farms and the analysis of socio-economic constraints.

19. The Intergovernmental Oceanographic Commission (IOC) of UNESCO provides a good scientific focus for regional activities in the field of biodiversity, as well as for inputs directly to the Convention secretariat, through the IOC Programme on Ocean Science in Relation to Living Resources (OSLR), the Global Coral Reef Monitoring Network and the IOC Marine Biodiversity Strategy. Over the longer term, the establishment of a Global Ocean Observing System will provide a basis for systematic monitoring of factors relevant to assessments of marine biodiversity. OSLR represents a framework programme for IOC member States to share knowledge, develop cooperative actions and address uncertainties about marine living resources and their biodiversity, through joint scientific research, in conjunction with international and intergovernmental initiatives and programmes. The IOC marine biodiversity strategy includes components on monitoring, training and capacity-building.

20. UNESCO activities relating to biodiversity in small island developing States under the Heritage Convention include promotion of international instruments for protecting biological diversity and the natural heritage; conservation as part of sustainable development; integrated coastal management; and traditional ecological knowledge about small island developing States biodiversity. As part of its medium-term strategy, the Twenty-Eighth UNESCO General Conference adopted a six-year multidisciplinary project, entitled "Environment and development in coastal regions and small islands". In January 1996, the organization launched an interregional project, entitled "Integrated biodiversity strategies for islands and coastal areas", with the goal of assisting integrated biodiversity strategies for interregional cooperation between coastal States and islands, and promoting implementation of the Convention on Biological Diversity.

21. There has been heightened interest in traditional approaches to the use and management of natural resources. UNESCO work in this area includes promoting ethnobotany

and sustainable use of plant resources within the World Wildlife Foundation (WWF)/UNESCO/Royal Botanic Gardens Kew Initiative on People and Plants; support to the regional non-governmental organization TRAMIL for work on popular use of Caribbean medicinal plants; and regional collaborative research on Caribbean coral reefs and beach stability.

22. UNEP extended assistance to small island developing States within the framework of the climate change, biological diversity, and desertification conventions. Small island developing States-related work within the UNEP sub-programme "Caring for freshwater, coastal and marine resources (1998-1999)", includes facilitation of policy-relevant assessments of the state of small island developing States fresh and marine waters, and their living resources, and development of tools and guidelines for sustainable management and use of small island developing States' fresh and coastal waters and living resources. Further, the recently adopted Global Programme of Action for the Protection of Marine Environment from Land-based Activities envisions a number of regional workshops, some in small island developing States, to address land-based environmental pollution, including its impacts on biodiversity. Under its sub-programme, "Caring for biological resources", and within the context of the Convention, UNEP is providing assistance to developing countries, including small island developing States, in the formulation of policy instruments for the integrated management of biological resources. Small island developing States also benefit from UNEP scientific support and technical advisory services in preparation of (a) biodiversity country studies; (b) biodiversity data management projects; (c) the formulation and implementation of national biodiversity strategies and action plans; and (d) the preparation of national biosafety frameworks, which also review the biodiversity of small island developing States.

23. An international coral reef initiative workshop was held in Seychelles in 1996 for the Western Indian Ocean and the East African region, to establish the basis for a strategy and action plan for conserving and managing coral reefs in the region. UNEP continues to assist small island developing States in enhancing their technical and managerial capacities for environmental management, including biodiversity, through its regional advisory services programme, which facilitates the continuous training of national experts.

24. The organization has secured GEF funds for biodiversity country studies, biodiversity data management, national biodiversity strategy and action plans and/or national biosafety frameworks for a number of small island developing States, including the Bahamas, Barbados, Cuba, Mauritius, Seychelles, Solomon Islands, Saint Lucia and Vanuatu. It has also produced technical documents on the features of biodiversity in small island developing States, using geographic information systems databases, and is currently assisting the Bahamas, Barbados, Seychelles, Solomon Islands and Vanuatu in developing national biodiversity action plans, funded by GEF. Other activities undertaken by UNEP in support of small island developing States include (a) a workshop on implementation of international conventions related to biological diversity, held in Mozambique in 1997; (b) assistance in developing a draft law on marine conservation areas for Tuvalu; and (c) assistance in preparing a draft framework on environmental law for Kiribati, which contains provisions on conservation of biodiversity.

25. In 1996, the General Assembly of the World Conservation Union (IUCN) requested its members, commissions and the Director-General to assist small island developing States in the implementation of the Programme of Action for the Sustainable Development of small island developing States. Through its Biodiversity Policy Coordination Division, IUCN convened a workshop on additional funding sources for small island developing States for Convention implementation. Further, it organized a workshop on marine biodiversity jointly with the first meeting of the Conference of parties to the Convention. In collaboration with UNEP, IUCN is developing a global strategy and action plan for alien invasive species, which are a major problem for small island developing States' biodiversity.

26. IUCN has also engaged in work on management and sustainable use of marine and coastal resources through its regional and country offices. In the context of the Convention on Biological Diversity, IUCN is working to facilitate implementation of the Jakarta Mandate, including key small island developing States issues, such as protected areas, alien species, integrated marine and coastal area management, marine and coastal living resources and mariculture. In collaboration with the Centre for International Environmental Law and WWF, it has published a document, entitled "Biodiversity in the seas". In collaboration with UNEP and World Resources Institute, it has co-published a document, entitled "National biodiversity planning: guidelines based on early experiences around the world."

27. The World Conservation Monitoring Centre (WCMC) has developed large databases on small island developing States biodiversity, which contain much information on small island developing States threatened species, habitats and protected areas (see table). These databases have been

the foundation for a series of recent WCMC reports on the status of small island developing States biodiversity. It also has undertaken a global review of small island developing States' biodiversity, identifying a number of global threats, including demographic and developmental pressures and natural disasters.

28. Issues relevant to small island developing States' biodiversity have been addressed in two global WWF publications, *World Conservation Strategy*, and *Caring for the Earth: A Strategy for Sustainable Living*. These publications give a comprehensive account of major small island developing States concerns, and provide a solid basis for the consideration of issues covered in the Programme of Action for the Sustainable Development of Small Island Developing States.

29. Specific actions to be taken by the secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) include designation of a small island developing States coordinator for CITES activities; preparation of information packets for non-Party small island developing States; provision of technical assistance to parties and non-parties; and conveyance of specific recommendations to non-party small island developing States encouraging actions to promote compliance with CITES requirements.

V. Conclusions and recommendations for future action at the national, regional and international levels

A. Conclusions

30. The biodiversity of small island developing States is seriously threatened by a combination of natural and anthropogenic factors. Effective conservation and sustainable use of small island developing States biodiversity entails the sustainable management of genetic resources for food and agriculture – forestry, fisheries and aquaculture – which may call for a "farming systems" approach. For forestry and capture fisheries, it implies adopting an environmentally sound and socially beneficial management approach, integrated with other land and water management. Community-based management systems and related land and fishing rights in supporting food systems are important as a basis for applying this approach. Implementation of relevant, regional and international agreements are particularly important for fishery resources that migrate through or straddle areas of the natural jurisdiction of small island developing States.

31. In order to curb rapid loss of biodiversity, the deforestation caused by agricultural expansion and overharvesting of forests must be controlled so as to reverse the serious environmental consequences of lost tree cover and downstream impacts on marine areas. For sustainable forest use, the remaining forest areas of most small island developing States require urgent attention, including possible reorganization of the entire logging industry sector. Deforestation must be monitored and minimized through a coordinated policy for effective use and conservation. In erosion-prone areas, farmers must be encouraged to adopt appropriate agro-forestry practices, which also should become an established component of integrated rural development.

32. Further research into the "greening" of small island developing States is necessary to improve knowledge of the original indigenous plant species and formations; select and use local species suitable for incorporation in soil and water conservation, range regeneration and fodder production, and fuelwood supply; and screen and eventually introduce suitable non-indigenous species from similar habitats.

B. Recommendations

33. Further efforts are needed at all levels to implement the actions, policies and measures identified in the Programme of Action. Moreover, additional measures are also needed to:

(a) *At the national level*:

(i) Build national technological and human capacity for managing natural resources, and upgrade national capabilities for marine and terrestrial resource surveys, by training key personnel and implementing measures to retain their services within the public sector;

(ii) Introduce charges for using sea lanes and straits to internalize part of the costs of small island developing States biodiversity losses arising from inappropriate practices, such as waste discharges, incineration or accidental spills in proximate national or international waters. Charges and taxes on enterprises for discharges of inadequately treated wastes should also be considered, taking into account the potential biodiversity losses resulting from such practices;

(iii) Strengthen national capabilities to maintain agro-biodiversity, including animal and plant protection and quarantine services, through assessment and strengthening of national legislation, facilities and services, including surveillance;

(iv) Enhance farming systems and improve management of natural resources, as applicable; rehabilitate degraded habitats, where appropriate; and monitor the impact of development programmes, including the impact of introduced species on native ecosystems, and the success of rehabilitation efforts;

(v) Evaluate and modify, if necessary, and implement existing guidelines and codes of practice on best practices in farming systems and species introduction;

(b) *At the regional level*:

(i) Strengthen regional activities for harmonizing legislation and promoting the exchange of technologies and expertise;

(ii) Strengthen the capacity of regional bodies to undertake surveys on reef, estuary, wetland and lagoon resources; monitor and promote innovative coral reef and mangrove programmes.

(c) *At the international level*:

(i) Assist small island developing States in developing inventories of marine biodiversity resources and in strengthening regional and marine research centres;

(ii) Support participation of small island developing States representatives in relevant global negotiation processes, including in meetings of the Convention on Biological Diversity, especially the Conference of parties to the Convention and its Subsidiary Body on Scientific, Technical and Technological Advice, and in expert and liaison groups, to ensure appropriate consideration of small island developing States priorities;

(iii) Supports small island developing States in strengthening national and regional capabilities for the conservation and sustainable use of genetic resource for food and agriculture, including implementation of priorities identified in the Global Plan of Action for Plant Genetic Resources;

(iv) Provide technical assistance to assess and revise, where needed, national legislation, implement appropriate training, and enhance database development and technology transfer. Countries which import small island developing States animal and plant resources should be encouraged to assist small island developing States in upgrading their facilities and strengthening animal and plant protection and quarantine services to ensure achievement of international standards.